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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,644	05/16/2002	Nikolaus Benninger	2034	3577

7590 04/20/2004

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EXAMINER

MEDINA SANABRIA, MARIBEL

ART UNIT PAPER NUMBER

1754

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/069,644	BENNINGER ET AL.	
	Examiner	Art Unit	
	Maribel Medina	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 1/19/04.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 16-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

**Rejections Withdrawn and Maintained**

1. The rejections of claims 16-25 and 27-30 under 35 USC 102(b) as being anticipated by Murphy et al have been withdrawn in view of the amendment to claim 16.
2. The rejection to claims 16-30 under 35 U.S.C. 103(a) as being unpatentable over Murphy et al in view of EP 758713 A1 (Murachi et al) is maintained.

**Claim Rejections - 35 USC § 103-Maintained**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 16 -30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy et al in view of EP 758713 A1 (Murachi et al).

Regarding claim 16, Murphy et al disclose a method for treating an exhaust gas from an internal combustion engine in a motor vehicle (See col. 1, lines 5-16). The method comprises the steps of: obtaining hydrogen by electrolysis (instant hydrolysis) by a electrolysis unit (50) connected to a water tank (48); delivering a metered addition of the hydrogen to an exhaust gas as a function of a demand for hydrogen occurring at certain operating states and/or functions of a catalytic converter (31); performing the delivery of the hydrogen in a direction of flow of the exhaust gas in a location selected from between an oxidation catalytic converter (11) and a NO<sub>x</sub> storage catalytic converter (31); and upstream of the oxidation catalytic converter and a NO<sub>x</sub> storage catalytic converter (See Figure 1, and col. 5, lines 20-34).

Regarding the limitation of claim 16 that reads “performing the delivery of the hydrogen in a direction of flow of the exhaust gas at a location .... upstream of the oxidation catalytic converter and a particle filter of an exhaust gas line” and claim 26, Murphy et al disclose that the method can be used in diesel engines, but fails to disclose that the diesel engine exhaust gas line comprises a particle filter (for claim 16) and fail to disclose raising the temperature of the exhaust gas in order to guarantee that regeneration conditions are met when the particle filter is employed (for claim 26).

Murachi et al is relied upon to teach that diesel engines exhaust-gas lines contain an oxidation catalyst (5); a particle filter (7); and a NO<sub>x</sub> storage catalytic converter (9) in that order (See Abstract and Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have had a particle filter downstream from the oxidation catalyst in the exhaust – gas line of Murphy et al and delivered the hydrogen in the diesel engine of Murphy et al at a location upstream of the oxidation catalyst and a particle filter in the exhaust-gas line, since Murachi et al recognizes that it is common and well known that the particle filter is downstream from the oxidation catalyst and since Murphy et al disclose the addition of hydrogen before the oxidation catalyst.

Regarding claims 17, Murphy et al disclose the production of hydrogen required in each case on demand in the hydrolysis unit (See col. 6, lines 4-10).

Regarding claim 18, Murphy et al provides a hydrogen tank (52) that stores a certain quantity of the hydrogen produced by the hydrolysis unit (52) (See Figure 1, and col. 8, lines 40-54).

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Regarding claim 19, Murphy et al disclose the use of a pressure sensor (133) to dimension the hydrogen of hydrogen storage tank (52), and disclose that the hydrogen in the tank is used to heat and regenerate the NO<sub>x</sub> storage catalytic converter (See col. 8, lines 40-45 and col. 6, lines 40-48).

Regarding claim 20, Murphy et al disclose registering the temperature of the exhaust gas (See col. 12, lines 64-68) and registering certain operating conditions of the catalytic converter (See col. 7, lines 23-29).

Regarding claims 21, 24, and 25, Murphy et al disclose, in col. 6, lines 33-45, conditioning the catalyst (i.e. heating, cleaning, and/or activating) by injecting hydrogen, this clearly is a regenerating step that inherently will restore the conversion rate after sulfur poisoning, at oxidations stages of the NO<sub>x</sub> catalytic converter.

Regarding claims 22 and 23, Murphy et al disclose the claimed method wherein the internal combustion engine is either a diesel or gasoline engine (see col. 8, lines 65-67) and disclose in col. 7, line 30 to col. 8, line 67, that the hydrogen is added in order to compensate for the hydrocarbons removed by their oxidation in the oxidation catalyst.

In regards to claim 26, Murachi et al disclose that in order to regenerate the particle filter the exhaust gas temperature should be increased (See col. 4, lines 3-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have raised the temperature of the exhaust gas in the diesel internal combustion engine containing a particle filter of Murphy et al to regenerate the particle filter.

Regarding claim 27, Murphy et al disclose an apparatus comprising: an electrolysis unit (52) (instant hydrolysis unit); a metering device (138, 137) connected to the electrolysis unit via

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a hydrogen line; a control/regulating unit (132) that is functionally connected to the hydrolysis unit and the metering device; and additional points at which hydrogen is added to the exhaust gas in a direction of flow of the exhaust gas in a location selected from between an oxidation catalytic converter (11) and a NO<sub>x</sub> storage catalytic converter (31), and upstream of the oxidation catalytic converter and a NO<sub>x</sub> storage catalytic converter (See Figure 1, and col. 5, lines 20-34).

Regarding claim 28, Murphy disclose the use of solenoid valves (137, and 138)

Regarding claim 29, Murphy et al disclose the use of a hydrogen storage tank (52) downstream of the electrolysis unit (50).

Regarding claim 30, the control/regulating unit (132) comprises a catalytic converter monitoring function (51) that is functionally connected to an exhaust-gas sensor system (See col. 12, lines 58-68).

### **Response to Arguments**

5. Applicant's arguments filed on 1/19/04 have been fully considered but they are not persuasive. Applicants' argue that from Murachi et al, "that the hydrogen delivery would no work". However, Murachi et al is relied upon to show that the particle filter is used in diesel engines after an oxidation reactor and Murphy et al disclose the use of hydrogen injection before an oxidation reactor in a diesel engine. The combination of the references clearly discloses the claimed invention. The fact that Murachi et al disclose a different mode for regenerating the particle filter as argued in page 10, does not preclude that the hydrogen would work in the combined reference process.

**Conclusion**

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maribel Medina whose telephone number is (571) 272-1355. The examiner can normally be reached on Monday through Friday from 7:30 AM to 4:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Maribel Medina   
Examiner  
Art Unit 1754

  
**STEVEN BOS**  
**PRIMARY EXAMINER**  
**GROUP 1100**